REMARKS

I. Status of the Claims

Claims 1-34 are pending. Claims 1-13, 32 and 33 are allowed. Applicants appreciate the Examiner's allowance of claims 1-13, 32 and 33. Claims 14, 15, 17-31 and 34 are rejected. Claim 16 is objected to as depending from a rejected base claim but would be allowable if rewritten in independent form.

In the amendments above, Applicants have rewritten claim 16 in independent form incorporating the elements of claim 14 into claim 16.

Also in the amendments above, Applicants have amended each of claims 14, 16, 29, 31, and 34 to recite "alpha, beta-unsaturated carbonyl compound different from the AMPS reactant." Support for the amendment to these claims may be found throughout the specification and claims as originally filed. Support for this amendment may be found, for example, at page 13, lines 15-22.

Claim 29 has also been amended to recite weight percentages of AMPS reactant, alpha, beta-unsaturated carbonyl compound and hydrophobe reactant. Support for the amendment to claim 29 can be found throughout the specification and claims as originally filed - for example, at page 15, line 22 to page 16, line 6.

Also in the amendments above, Applicants have amended claim 22 to correct minor formalities. Specifically, Applicants have inserted the word "is" after the term "cross-linking agent" and have inserted and end bracket,], after the term "2-propenamide."

Applicants have added new claims 35 and 36, which are very similar to original claims 14 and 29, respectively, except that new claims 35 and 36 each recites "alpha, beta-unsaturated carboxylic acid compound." Support for new claims 35 and 36 may be found throughout the specification and claims as originally filed. Support for new claims 35 and 36 may be found, for example, at original claims 14 and 29 and at page 13, lines 18-22.

Applicants have enclosed a Fee Transmittal form for payment for 3 additional independent claims (claims 16, 35, and 36).

Applicants request entry of the amendments and reexamination of the application.

II. Each of claims 14, 15, 17-27, 29-31 and 34 Meets the Enablement Requirement of 35 U.S.C. § 112, First Paragraph

Claims 14, 15, 17-27, 29-31, and 34 are rejected under 35 U.S.C. § 112, first paragraph. The Examiner asserts that the specification does not reasonably provide enablement for alpha,beta unsaturated carbonyl compounds. Applicants traverse the rejection.

Each of claims 14, 15, 17-27, 29-31, and 34 meets the enablement requirement of 35 U.S.C. § 112, first paragraph. In particular, the application discloses numerous examples of compounds that meet the claim feature "alpha,beta unsaturated carbonyl compound" of claims 14, 15, 17-27, 29-31, and 34 including but not limited to amides, esters, and carboxylic acids. For example, the specification discloses acrylamide at page 2, line 17, which is an amide that satisfies the element "alpha,beta unsaturated carbonyl compound." The specification discloses carboxylic acids that satisfy the element "alpha,beta unsaturated carbonyl compound." See, for example, page 13, lines 18-21. The specification (see page 4, lines 6-9) also incorporates by reference the published patent application WO 85/03510. WO 85/03510 discloses in numerous instances amides (e.g., acrylamide, methyacrylamide, fumaramide, etc.), carboxylic acids (e.g., methacrylic acid, itaconic acid, fumaric acid, etc.) and esters and aminoalkyl esters of unsaturated carboxylic acids that satisfy the element "alpha,beta unsaturated carbonyl compound." Accordingly, the specification teaches numerous different compounds that satisfy the feature "alpha,beta unsaturated carbonyl compound."

In addition, the specification provides numerous examples of how to make and use such compounds. See examples I-VII on pages 22-37 of the specification. It is well established that as long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement is satisfied. The specification discloses numerous examples and teaches the use of numerous compounds that satisfy the element "alpha,beta unsaturated carbonyl compound." Thus, the specification provides sufficient

disclosure and teaching such that the person of ordinary skill in the art would not be required to perform undue experimentation. Accordingly, the rejection is improper and should be withdrawn.

III. Each of claims 14, 15, 17-27, 29-31 and 34 Meets the Requirement of 35 U.S.C. § 112, Second Paragraph

Claims 14, 15, 17-27, 29-31, and 34 are rejected under 35 U.S.C. § 112, second paragraph. The Examiner asserts that it is not clear if the claim is satisfied by the combination of AMPS and ester compounds only. Applicants traverse the rejection in view of the amendments to the claims.

Amended claim 14 defines a composition comprising a water soluble associative polymer formed as the polymerization reaction product of reactants comprising: AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them, having a -COOR moiety wherein R is a hydrophobe which, as moieties of the resultant associative polymer, are associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid; and alkali metal salt of carboxylic acid. Thus, the polymerization reaction product of amended claim 14 comprises reactants comprising AMPS reactant, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant. Accordingly, amended claim 14 meets the definiteness requirement of 35 U.S.C. § 112, second paragraph.

Each of claims 15 and 17-27 depends directly or indirectly from claim 14 and meets the definiteness requirement of 35 U.S.C. § 112, second paragraph for at least the same reasons.

Similarly, amended claim 29 meets the definiteness requirement of 35 U.S.C. § 112, second paragraph. Amended claims 29 recites a polymerization reaction product of reactants comprising: 5 to 95 wt.% AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them; 5 to 95 wt.% alpha, beta-unsaturated carbonyl compound different from the AMPS reactant;

and 0.2 to 2.0 wt.% hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them. Thus, the polymerization reaction product of amended claim 29 comprises reactants comprising AMPS reactant, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant. Accordingly, amended claim 29 meets the definiteness requirement of 35 U.S.C. § 112, second paragraph.

Claim 30 depends directly from claim 29 and meets the definiteness requirement of 35 U.S.C. § 112, second paragraph for at least the same reasons as claim 29.

Amended claim 31 recites an aqueous well service fluid comprising: water soluble associative polymer formed as the polymerization reaction product of reactants comprising: AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them, having a -COOR moiety wherein R is a hydrophobe which, as moieties of the resultant associative polymer, are associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid; and alkali metal salt of carboxylic acid. Thus, the polymerization reaction product of amended claim 31 comprises reactants comprising AMPS reactant, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant. Accordingly, amended claim 31 meets the definiteness requirement of 35 U.S.C. § 112, second paragraph.

Amended claim 34 recites a method comprising introducing into a wellbore a fluid comprising water soluble associative polymer formed as the polymerization reaction product of reactants comprising: AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them, having a -COOR moiety wherein R is a hydrophobe which, as moieties of the resultant associative polymer, are associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid; and alkali metal salt of carboxylic

acid. Thus, the polymerization reaction product of amended claim 34 comprises reactants comprising AMPS reactant, alpha, beta-unsaturated carbonyl compound different from the AMPS reactant, and hydrophobe reactant. Accordingly, amended claim 34 meets the definiteness requirement of 35 U.S.C. § 112, second paragraph.

The Examiner also asserts that claim 20 is indefinite because the percentages add up to more than 100%. Applicants traverse the rejection.

Claim 20 recites the composition of amended claim 14 wherein the hydrophobe associative polymer has: 5 to 95 wt.% structural units derived from the AMPS reactant; 5 to 95 wt. % structural units derived from the alpha, beta-unsaturated carbonyl compound; and 0.2 to 2.0 wt.% structural units derived from the hydrophobe reactant. It is accepted practice to recite ranges for the elements that make up a composition even if the expressly recited ranges, when added together, would total more than 100%. It is understood by the person of ordinary skill in the art that the percentages of the elements selected (*e.g.*, the selected percentage of structural units derived from AMPS, the selected percentage of structural units derived from alpha, beta-unsaturated carbonyl compound, and the selected percentage of structural units derived from the hydrophobe reactant) cannot be chosen to add to more than 100%, because it is not possible to have more than 100 wt.%. For example, if a hydrophobe associative polymer has 90 wt.% structural units derived from AMPS reactant, then the remaining 10 wt.% of the hydrophobe associative polymer is from structural units derived from the alpha, beta-unsaturated carbonyl compound and/or structural units derived from the hydrophobe reactant. However, in this example, the person of ordinary skill in the art would not select more than 10 wt.% reactants from the remaining two reactants. Accordingly, claim 20 is definite and meets the requirements of 35 U.S.C. § 112, second paragraph. Applicants request withdrawal of the rejection.

IV. Claims 28-30 are Patentable over Chang

Claims 28-30 are rejected under § 102(e) in view of Chang (US 2002/0111450A1). The Examiner asserts that Chang teaches a copolymer comprising

AMPS, acrylic acid butyl acrylate and ethyl-hexyl acrylate. Applicants traverse the rejection.

Claim 28 is patentable over Chang because Chang fails to disclose a water soluble hydrophobe associative polymer having functionality including at least sulfonate groups, carboxylate groups and hydrophobes associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid. In particular, nowhere does Chang disclose water soluble hydrophobe associative polymer having functionality including hydrophobes associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid. That is, there is no disclosure that Chang's ion-sensitive hard water dispersible polymers provide such properties. Instead, Chang states at Col. 2, lines 3-5 that "The ion-sensitive polymers of -the present invention have a "trigger property," such that the polymers are insoluble in high salt solutions." Accordingly, Chang expressly states that its polymer is not soluble in high salt solutions. Thus, claim 28 is patentable over Chang.

Chang also fails to disclose the subject matter of amended claim 29, which recites a polymerization reaction product of reactants comprising: 5 to 95 wt.% AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them; 5 to 95 wt.% alpha, beta-unsaturated carbonyl compound different from the AMPS reactant; and 0.2 to 2.0 wt.% hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them. In particular, Chang fails to disclose any polymerization reaction product having the reactants and the recited amounts of the reactants defined by claim 29. Thus, claim 29 is patentable over Chang.

Claim 30 depends from claim 29 and is patentable over Chang for similar reasons and for the additional reason that claim 30 recites that the hydrophobe reactant of claim 29 has a -COOR moiety wherein the R moieties, as moieties of the reaction product, are hydrophobes associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid. As discussed above, the polymers of Chang are expressly stated to be insoluble in high salt solutions. Thus, claim 30 is patentable over Chang.

Applicants request withdrawal of the rejection.

V. Claims 28-30 are Patentable over Das

Claims 28-30 are rejected under § 102(b) in view of Das (US 4,177,178). The Examiner asserts that Das teaches a copolymer which comprises AMPS, acrylic acid, and the esters butyl methacrylate, ethylhexyl methacrylate and stearyl methacrylate. Applicants traverse the rejection.

Claim 28 is patentable over Das because Das fails to disclose a water soluble hydrophobe associative polymer having functionality including at least sulfonate groups, carboxylate groups and hydrophobes associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid. Instead, Das expressly states at Col. 2, lines 11-15 that "The acrylic polymers of the present invention differ from those of U.S. Pat. No. 3,890,292 in that they are thermosetting in nature and when applied result in non-tacky, water-insoluble coatings." Thus, claim 28 is patentable over Das.

Das also fails to disclose the subject matter of amended claim 29, which recites a polymerization reaction product of reactants comprising: 5 to 95 wt.% AMPS reactant selected from acrylamidomethylpropanesulfonic acid, salts thereof and a mixture of any of them; 5 to 95 wt.% alpha, beta-unsaturated carbonyl compound different from the AMPS reactant; and 0.2 to 2.0 wt.% hydrophobe reactant selected from acrylic esters, methacrylic esters and a mixture of any of them. In particular, Das fails to disclose any polymerization reaction product having the reactants and the recited amount of the reactants defined by claim 29. Thus, claim 29 is patentable over Das.

Claim 30 depends from claim 29 and is patentable over Chang for similar reasons and for the additional reason that claim 30 recites that the hydrophobe reactant of claim 29 has a -COOR moiety wherein the R moieties, as moieties of the reaction product, are hydrophobes associative with one another in a saturated aqueous solution of an alkali metal salt of a carboxylic acid. Thus, claim 30 is patentable over Das.

Applicants request withdrawal of the rejection.

VI. Conclusion

Applicants respectfully request entry of the foregoing amendments and reexamination of the application.

Respectfully submitted,
Benton et al.

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